REMARKS

Claims 2 and 4-12 remain in the application. Claims 1, 3 and 13-17 were previously canceled without prejudice.

Applicants' Response as Requested in Latest Office Action

Applicants respectfully submit that while progressive-to-interlace conversion is known, such conversion is conventionally performed by either 1) line dropping or 2) frame separation. Line dropping is illustrated in FIG. 2 of the present application, and frame separation is illustrated in FIG. 3 of the present application. For convenience of reference, those figures are reproduced below.
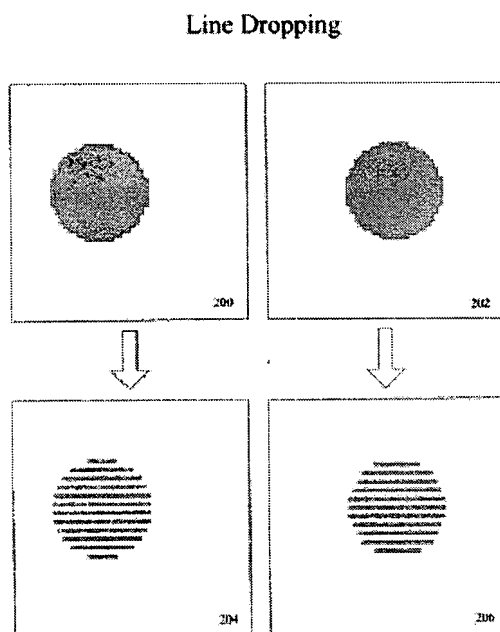
Line Dropping

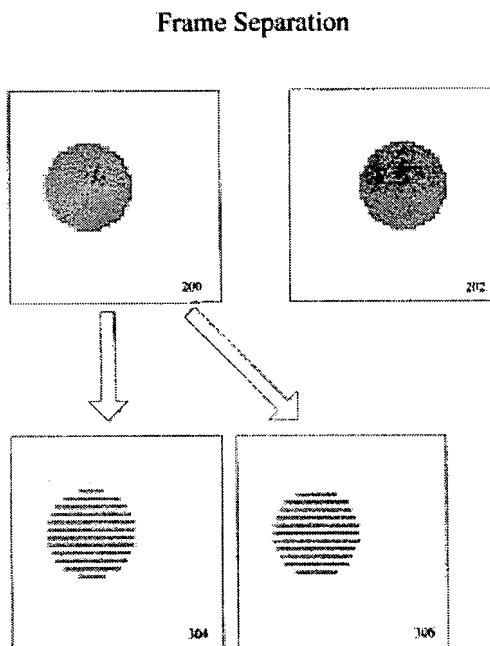Frame Separation

Fig. 2
Background Art

Fig. 3
Background Art

As illustrated above, line dropping involves dropping even or odd lines from alternate frames of the progressive sequence, while frame separation involves subdividing a progressive frame into odd and even fields, and staggering display of the fields in time.

Given the conventional techniques for progressive-to-interlace conversion, applicants respectfully submit that it is not obvious how the progressive-to-interlace conversion may be significantly improved. The present application discloses a new technique which significantly improves the result of the conversion in that it outputs a **smoother** interlaced video sequence.

In particular, while the above-discussed conventional techniques operate on the **lines** of a progressive video frame to generate the interlaced frames, the claimed invention focuses on **objects** in the progressive video frames to create a smoother resultant interlaced sequence. *Applicants respectfully submit that the claimed method which focuses upon* **objects, rather than lines,** *for converting progressive video to interlaced video is highly inventive and non-obvious.*

Regarding the MPEG-4 protocol, MPEG-4 and other similar technologies use video objects for purposes such as compression and object profiling. However, applicants respectfully submit that **none of these previous technologies teach that conversion from progressive to interlaced video may be made substantially smoother by using video objects.** Moreover, one of ordinary skill in the art would not think that progressive-to-interlaced video conversion, which is inherently a **line-based** procedure, would be improved by using video **objects** and motion estimates thereof.

Previous Claim Rejections--Section 103

Claims 2 and 4-12 were previously rejected under 35 USC 103(a) as being unpatentable over DeHann (USP 6,937,655) in view of Doricutt (USP 5,329,309). Applicants respectfully traverse this rejection.

Previously presented claim 2 recites as follows.

2.   A method for interlacing a progressive video sequence to produce **an interlaced video sequence of alternating odd and even fields**, the method comprising:

obtaining at least two consecutive frames of a progressive scan video sequence;

segmenting at least one of said frames into constituent objects;

estimating a motion of said constituent objects between the at least two frames;

using the estimated motion for each object between frames to interpolate the motion of each object between the first frame and an intermediate frame;

using the interpolated motion for each object to construct the intermediate frame;

extracting a first alternating field from the first frame; and

extracting a second alternating field from the intermediate frame,

wherein the first and second alternating fields comprise the odd and even fields of the interlaced video sequence.

(Emphasis added.)

First, as shown above, claim 2 requires **"segmenting at least one of said frames into constituent objects;" "estimating a motion of said constituent objects between the at least two frames;"** and **"using the**

estimated motion for each object between frames to interpolate the motion of each object between the first frame and an intermediate frame." As discussed above under the *Applicants' Response as Requested in the Latest Office Action*, the conventional methods for progressive-to-interlaced conversion (an inherently **line-based** procedure) did <u>not</u> in any way contemplate using **objects** for the conversion procedure.

In addition, previously presented claim 2 also requires "**extracting a first alternating field from the first frame; and extracting a second alternating field from the intermediate frame, wherein the first and second alternating fields comprise the odd and even fields of the interlaced video sequence.**" These steps of claim 2 relate to steps in original claim 3, which was previously canceled.

Applicants respectfully submit that claim 2, as previously presented, is patentably distinguished over DeHann in view of Doricutt.

Regarding DeHann, applicants respectfully submit that DeHann does <u>not</u> relate to progressive-to-interlaced video conversion. As such, DeHann et al does not disclose or teach a technique for "extracting a first alternating field from the first frame; and extracting a second alternating field from the intermediate frame, wherein the first and second alternating fields comprise the odd and even fields of the interlaced video sequence." More particularly, DeHann does <u>not</u> teach using estimated motion of the **objects** between progressive frames in creating an intermediate frame.

Regarding Doricutt, applicants respectfully submit that Doricutt also does not teach using estimated motion of the **objects** between progressive frames in creating an intermediate frame.

For at least the above discussed reasons, applicants respectfully submit that claim 2 is now patentably distinguished over the applied references.

Claims 4-12 depend from claim 2. As such, applicants respectfully submit that claims 4-12 are also patentably distinguished over the applied references for at least the same reasons as discussed above in relation to claim 2.

Conclusion

For at least the above reasons, it is respectfully submitted that pending claims 2 and 4-12 are now patentably distinguished over the applied references. Favorable action is respectfully solicited.
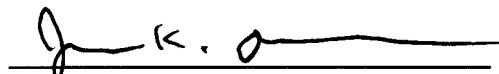
The Examiner is invited to call the undersigned for any questions.

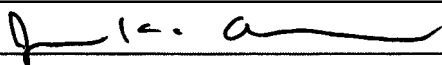Respectfully submitted,

Gary R. Holt, et al.

Dated: <u>August 6, 2007</u>   By:

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Enclosure(s)

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